

Claims

- [c1] A door slidable between a door open position permitting travel therethrough and a door closed position obstructing travel therethrough comprising:
- a door frame defining a central opening therein through which ingress and egress can occur; and
 - an automatic closure system comprising:
 - a cable with a first end and a second end, wherein the first end is mounted to an upper portion of the sliding door;
 - a counterweight connected at the second end of the cable and movable between a counterweight open position when the sliding door is in the door open position and a counterweight closed position when the sliding door is in the door closed position, wherein the counterweight open position is above the counterweight closed position; and
 - a pulley mounted to the door frame for redirecting the cable from a generally horizontal orientation near the first end to a generally vertical orientation near the second end;
- wherein when a force is applied to the sliding door to cause the sliding door to slide to the door open position,

the counterweight is elevated from the counterweight closed position to the counterweight open position by virtue of the attachment of the cable to the sliding door via the pulley, and when the force is released, the counterweight descends to the counterweight closed position thereby returning the sliding door to the door closed position.

- [c2] The sliding door of claim 1, wherein the automatic closure system further comprises a bracket mounted to the upper portion of the sliding door, wherein the cable is mounted to the bracket.
- [c3] The sliding door of claim 1, wherein the sliding door is a screen door.
- [c4] The sliding door of claim 1, wherein the cable is made from nylon.
- [c5] The sliding door of claim 1, wherein the pulley is a wheel-type pulley.
- [c6] The sliding door of claim 1, wherein the pulley is a complex pulley system.
- [c7] The sliding door of claim 1, wherein the door frame comprises a door jamb and the automatic closure system further comprises a cover mounted on the door jamb to

visually conceal the pulley, the second end of the cable, and the counterweight.

[c8] The sliding door of claim 7, wherein the counterweight has a thin profile so that the counterweight can easily be concealed under the cover.

[c9] The sliding door of claim 8, wherein the counterweight is at least one of a lead plate, a lead rod, a lead member, a lead-filled tube and a stainless steel member.

[c10] The sliding door of claim 7, wherein the cover has an opening to permit the cable to pass through the cover.

[c11] The sliding door of claim 7, wherein the cover has an elongated shape so that the cover has an appearance similar to and blends in with the door jamb.

[c12] The sliding door of claim 1, wherein the automatic closure system further comprises an adjuster to control movement of the counterweight between the counterweight open and counterweight closed positions.

[c13] The sliding door of claim 12, wherein the adjuster comprises a housing and a U-shaped member fastened to the housing, wherein the cable is received within the U-shaped member.

[c14] The sliding door of claim 13, wherein the U-shaped

member can be selectively moved toward the housing to constrict the cable between the U-shaped member and the housing, thereby restricting movement of the cable through the adjustor, retardarding movement of the counterweight, and causing the sliding door to slide more slowly to the door closed position.

[c15] The sliding door of claim 14, wherein the U-shaped member can be selectively moved away from the housing to loosen the cable, thereby causing the sliding door to slide at a faster rate to the door closed position.

[c16] The sliding door of claim 15, wherein the adjustor further comprises thumb screws to move the U-shaped member relative to the housing.

[c17] The sliding door of claim 12, wherein the door frame comprises a door jamb, the automatic closure system further comprises a cover mounted on the door jamb to visually conceal the pulley, the second end of the cable, and the counterweight, and the adjustor is mounted to one of the door jamb and the cover.

[c18] The sliding door of claim 12, wherein the door frame comprises a door jamb; the automatic closure system further comprises a cover mounted on the door jamb to visually conceal the pulley, the second end of the cable,

the counterweight, and the adjustor; and wherein the adjustor comprises an arm having a first end mounted to the cover and a second end that extends towards the door jamb and abuts the counterweight as it moves between the counterweight open and counterweight closed positions,

wherein the second end of the arm imparts a damping force onto the counterweight as it moves between the counterweight open and counterweight closed positions, thereby causing the sliding door to move more slowly between the door open position and the door closed position.

[c19] The sliding door of claim 18, wherein the adjustor further comprises a bias adjustor to control the damping force imparted onto the counterweight by the arm.

[c20] The sliding door of claim 19, wherein the bias adjustor comprises a threaded fastener that is mounted through the cover and contacts the arm between the first and second ends of the arm so that movement of the threaded fastener towards the arm increases the amount of damping force exerted by the arm and movement of the threaded fastener away from the arm decreases the amount of damping force exerted by the arm.

[c21] The sliding door of claim 18, wherein the arm is com-

prised of a resilient material.

- [c22] The sliding door of claim 18, wherein the adjustor further comprises a spring mounted between the cover and the second end of the arm, wherein the spring biases the arm towards the counterweight.
- [c23] The sliding door of claim 1, wherein the automatic closure system further comprises a cable brake to stop movement of the cable to retain the sliding door in the door open position or in the door closed position.
- [c24] The sliding door of claim 23, wherein the cover has an opening to permit the cable to pass through the cover, and the cable brake comprises a flange mounted to the cover near the opening and a tab slidably mounted to the flange, wherein the tab is movable between a released position where the tab does not obstruct the cable from moving through the opening and an engaged position where the tab blocks the opening to prevent the cable from moving through the opening and thereby retain the sliding door in the door open position or in the door closed position.
- [c25] The sliding door of claim 1 and further comprising a damper, wherein the damper selectively applies a drag force on at least one of the pulley, the cable, and the

counterweight to control the travel of the sliding door during movement of the sliding door from the door open position to the door closed position.

[c26] The sliding door of claim 25 wherein the damper applies a compression force to the cable to control the movement of the sliding door.

[c27] The sliding door of claim 26 wherein the damper includes a U-shaped member which surrounds the cable and pinches the cable between at least one of the damper, the cover, and the door frame.

[c28] A kit for adapting a sliding door mounted within a door frame to automatically move between a door open position permitting travel therethrough and a door closed position obstructing travel therethrough, the kit comprising:

a cable with a first end and a second end, wherein the first end is adapted to be mounted to the sliding door;
a counterweight adapted to be connected at the second end of the cable and movable between a counterweight open position when the sliding door is in the door open position and a counterweight closed position when the sliding door is in the door closed position; and
a pulley adapted to be mounted to the door frame for redirecting the cable from a generally horizontal orienta-

tion near the first end to a generally vertical orientation near the second end;

wherein, when the pulley is mounted to the door frame and when the first end of the cable is mounted to the sliding door, passed through the pulley and has its second end mounted to the counterweight, the sliding door will automatically move between the door open position and the door closed position after a force is applied to the sliding door to cause the sliding door to move to the door open position whereby when the force is released, the counterweight descends to the counterweight closed position thereby moving the sliding door to the door closed position.

[c29] The kit of claim 28, wherein the automatic closure system further comprises a bracket adapted to be mounted to the upper portion of the sliding door, wherein when the bracket is mounted to the sliding door, the cable is mounted to the bracket.

[c30] The kit of claim 28, wherein the sliding door is a screen door.

[c31] The kit of claim 28, wherein the cable is made from nylon.

[c32] The kit of claim 28, wherein the pulley is a wheel-type

pulley.

- [c33] The kit of claim 28, wherein the pulley is a complex pulley system.
- [c34] The kit of claim 28, wherein the door frame comprises a door jamb and the automatic closure system further comprises a cover adapted to be mounted on the door jamb, wherein when the cover is mounted on the door jamb, the pulley, the second end of the cable, and the counterweight are visually concealed.
- [c35] The kit of claim 34, wherein the counterweight has a thin profile so that the counterweight can easily be concealed under the cover when the cover is mounted to the door jamb.
- [c36] The kit of claim 35, wherein the counterweight is at least one of a lead plate, a lead rod, a lead member, a lead-filled tube and a stainless steel member.
- [c37] The kit of claim 34, wherein the cover has an opening to permit the cable to pass through the cover when the cover is mounted to the door jamb.
- [c38] The kit of claim 34, wherein the cover has an elongated shape so that the cover has an appearance similar to and blends in with the door jamb when the cover is mounted

to the door jamb.

- [c39] The kit of claim 28, wherein the automatic closure system further comprises an adjuster to control movement of the counterweight between the counterweight open and counterweight closed positions.
- [c40] The kit of claim 39, wherein the adjustor comprises a U-shaped member and a housing adapted to be fastened to the U-shaped member, wherein when the U-shaped member is fastened to the housing, the cable is received between the U-shaped member and the housing.
- [c41] The kit of claim 40, wherein the U-shaped member is adapted to be selectively moved toward the housing so that when the cable is received in the U-shaped member, movement of the U-shaped member toward the housing constricts the cable therebetween, thereby restricting movement of the cable through the adjustor, retardard- ing movement of the counterweight, and causing the sliding door to slide more slowly to the door closed po- sition.
- [c42] The kit of claim 41, wherein the U-shaped member is adapted to be selectively moved away from the housing so that when the cable is received in the U-shaped member, movement of the U-shaped member away from

the housing loosens the cable, thereby causing the sliding door to slide at a faster rate to the door closed position.

- [c43] The kit of claim 42, wherein the adjustor further comprises thumb screws to move the U-shaped member relative to the housing.
- [c44] The kit of claim 39, wherein the door frame comprises a door jamb; the automatic closure system further comprises a cover adapted to be mounted on the door jamb, wherein when the cover is mounted on the door jamb, the pulley, the second end of the cable, and the counterweight are visually concealed; and the adjustor is adapted to be mounted to one of the door jamb and the cover.
- [c45] The kit of claim 39, wherein the door frame comprises a door jamb; the automatic closure system further comprises a cover adapted to be mounted on the door jamb to visually conceal the pulley, the second end of the cable, the counterweight, and the adjustor; and wherein the adjustor comprises an arm having a first end adapted to be mounted to the cover and a second end, wherein when the cover is mounted to the door jamb and the first end of the arm is mounted to the cover, the second end extends towards the door jamb and abuts and imparts a

damping force onto the counterweight as it moves between the counterweight open and counterweight closed positions, thereby causing the sliding door to move more slowly between the door open position and the door closed position.

- [c46] The kit of claim 45, wherein the adjustor further comprises a bias adjustor to control the damping force imparted onto the counterweight by the arm.
- [c47] The kit of claim 46, wherein the bias adjustor comprises a threaded fastener adapted to be mounted through the cover, wherein when the threaded fastener is mounted through the cover, the threaded fastener contacts the arm between the first and second ends of the arm, and movement of the threaded fastener towards the arm increases the amount of damping force exerted by the arm to the counterweight and movement of the threaded fastener away from the arm decreases the amount of damping force exerted by the arm to the counterweight.
- [c48] The kit of claim 45, wherein the arm is comprised of a resilient material.
- [c49] The kit of claim 45, wherein the adjustor further comprises a spring adapted to be mounted between the cover and the second end of the arm, wherein when the

spring is mounted between the cover and the second end of the arm, the spring biases the arm towards the counterweight.

- [c50] The kit of claim 28, wherein the automatic closure system further comprises a cable brake to stop movement of the cable to retain the sliding door in the door open position or in the door closed position.
- [c51] The kit of claim 50, wherein the cover has an opening to permit the cable to pass through the cover, and the cable brake comprises a flange adapted to be mounted to the cover near the opening and a tab slidably mounted to the flange, wherein when the flange is mounted to the cover, the tab is movable between a released position where the tab does not obstruct the cable from moving through the opening and an engaged position where the tab blocks the opening to prevent the cable from moving through the opening and thereby retain the sliding door in the door open position or in the door closed position.
- [c52] The kit of claim 28 and further comprising a damper, wherein the damper selectively applies a drag force on at least one of the pulley, the cable, and the counterweight to control the travel of the sliding door during movement of the sliding door from the door open position to the door closed position.

[c53] The kit of claim 52 wherein the damper applies a compression force to the cable to control the movement of the sliding door.

[c54] The kit of claim 53 wherein the damper includes a U-shaped member which surrounds the cable and pinches the cable between at least one of the damper, the cover, and the door frame.